TUGAS ANALISA ALIRAN DAYA

3.13. Draw an impedance diagram for the electric power system shown in Figure 3.32 showing all impedances in per unit on a 100-MVA base. Choose 20-kV as the voltage base for generator. The three-phase power and line-line ratings are given below.

G_1 :	90 MVA	20 kV	$X = 9\%$
T_1 :	80 MVA	20/200 kV	$X = 16\%$
T_2 :	80 MVA	200/20 kV	$X = 20\%$
G_2 :	90 MVA	18 kV	$X = 9\%$
Line:		200 kV	$X = 120\ \Omega$
Load:		200 kV	$S = 48$ MW $+j64$ Mvar

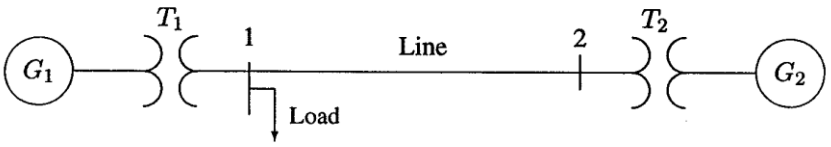

FIGURE 3.32
One-line diagram for Problem 3.13

3.41 Consider the single-line diagram of the power system shown in Figure 3.38. Equipment ratings are:

Generator 1:	1000 MVA, 18 kV, $X'' = 0.2$ per unit
Generator 2:	1000 MVA, 18 kV, $X'' = 0.2$
Synchronous motor 3:	1500 MVA, 20 kV, $X'' = 0.2$
Three-phase Δ–Y transformers T_1, T_2, T_3, T_4:	1000 MVA, 500 kV Y/20 kV Δ, X = 0.1
Three-phase Y–Y transformer T_5:	1500 MVA, 500 kV Y/20 kV Y, X = 0.1

Neglecting resistance, transformer phase shift, and magnetizing reactance, draw the equivalent reactance diagram. Use a base of 100 MVA and 500 kV for the 50-ohm line. Determine the per-unit reactances.

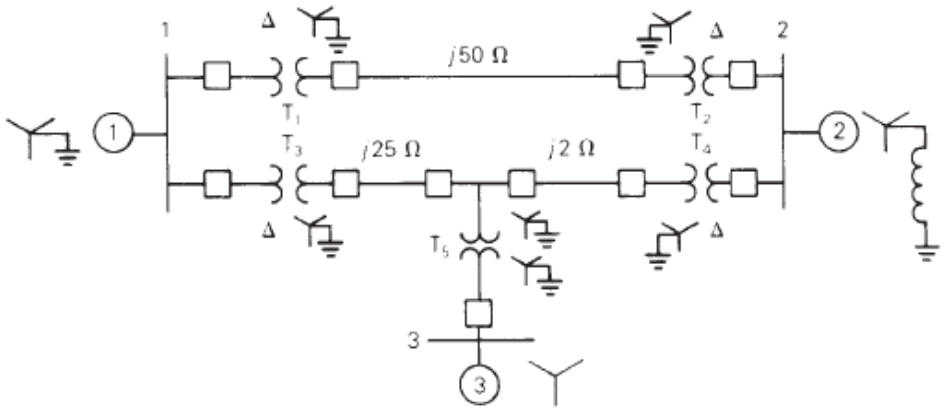

FIGURE 3.38
Problems 3.41 and 3.42

3.42 For the power system in Problem 3.41, the synchronous motor absorbs 1500 MW at 0.8 power factor leading with the bus 3 voltage at 18 kV. Determine the bus 1 and bus 2 voltages in kV. Assume that generators 1 and 2 deliver equal real powers and equal reactive powers. Also assume a balanced three-phase system with positive-sequence sources.